CORNET® Microsystem ED-65 Quick user's manual

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CORNET ED-65 Electrosmog meter is designed for quick measurement of high frequency (RF) Electromagnetic wave field strength and power level for living environment, excellent for individual or company with Electromagnetic wave safety concerns. It has broad bandwidth (100MHz to 6GHz), high sensitivity (-55dBm to 0dBm) and fast response time. The ED65 has build-in internal sensing antenna.

Applications:

- High frequency (RF) Electromagnetic wave field strength and signal level measurement
- Mobile phone base station antenna radiation power density measurement
- Wireless communication applications (AM/FM, TDMA, GSM, DECT, CDMA, WiMax)
- RF power level measurement for transmitters
- Wireless LAN (Wi-Fi, 2.4GHz/ 5.8GHz), Bluetooth, Ultra-wide-band detection, installation
- Spy camera, wireless bug finder
- Cellular/Cordless phone radiation safety level
- Microwave oven leakage detection
- Personal living environment EMF safety

Features:

- Broad Frequency range: **100MHz to 6GHz , (useful up to 8GHz)**
- High Dynamic range: **60 dB**
- High sensitivity: **-55dBm to 0dBm (25mv/m to 14.8V/m)**
- Peak power density measurement: **0.0015mw/m^2 to 580mw/m^2**
- Field strength measurement: **0.025v/m to 14.8v/m**
- Build-in internal sensing Antenna, no external antenna needed
- LCD digital power level, power density level, and E- field strength display with auto scale
- Moving graphic Histogram, and Bar signal level display (5dBm/segment)
- 8 high brightness color LED to display power density level with 3 safety range indications
- Continues wave (AM/FM) and high speed digital RF (GSM, TDMA, PCS, CDMA, Wi-Fi)
- Super fast response time with easy reading color LED segment display (5dBm/segment)
- Max. level display function, and Hold mode
- LCD back light (15 seconds auto-off) LCD back light on/off control
- Low battery indication
- Small, compact handheld design 13cmx6.5cmx3cm
- Battery operated (9V DC) *9V alkaline battery recommended, not included in the package

Usage guide:

(1) Put the 9V battery in the CORNET ED65, push the power switch button to turn on the ED65.

(2) The **RF sensor** is located in the left hand side of the ED65; please do not cover the sensor area with hand or other objects.

(3) There are two push button below the power switch: **"Mode"** button and **"Hold"** button. "Mode" button is used to switch in between RF power mode and Field strength modes. The "Hold" button is used to freeze the data reading of the ED65.

(4) In **RF power mode**, measured RF field strength/power density is shown on the digital LCD display with dBm and mw/m² (see Fig.1). In **Field strength modes**, measured RF field strength is shown on the LCD display with mw/m^2 or with v/m. (see Fig.2 and Fig.3)

(5) **8 LED lights**. With Red, Yellow, and Green color on the right hand side of LCD window is used for quick RF signal level indications. 3 Red LEDs are used to indicate the 3 safety range. The power level of each LED can be found in the table on the ED65 front panel.

(6) **Histogram** of previous 30 signal level readings are recorded and shown as moving graph on the LCD display.

(7) **"Hold"** button can be used to halt the data measurement of the ED65, a " HLD " mark will be shown on the LCD screen to indicate the "Hold" condition. Push the "Hold" button again, the ED65 will exit from the "Hold" condition.

(8) In Field strength modes, the " **Maximum value** " of the RF field measured since the last power-on is shown on the LCD display; this can be used to record the maximum field strength level automatically in the area. Pushing the HOLD button on/off will reset the Max. value.

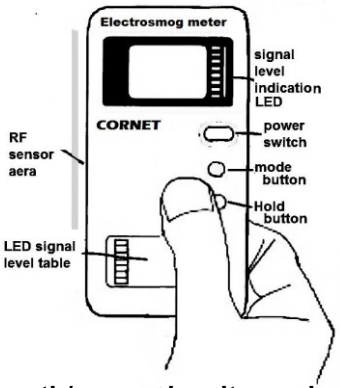
(9) **Correction factor (CF)** for signal level displayed ----- the signal level displayed on the LCD display can be adjusted by adding the correction factor(**CF**), from plus 1 to 20 dBm, or minus 1 to 20dBm. To setup the Correction factor, hold the 2nd push button down, turn on the power switch to get into **" Calibr menu "**. Use the 1st push button to move the cursor in the menu. Push the 2nd push button to increase or decrease the CF value. Use the CF-CLR to clear the CF value. The CF value is useful for field meter calibration adjustments**. *NOTE: the Correction factor will not increase the dynamic range of the ED65.** It only increase or decrease the offset of the signal level displayed by fixed amount. If the CF value is not zero, the CF value will be displayed on the top of LCD display with C+xx, or C-xx (note: xx is the CF value) when in Hold mode, to remind you the CF is on. 11 different CF value can be setup and stored in ED65, use **FB=**xx to select/store/use the CF value, the " **RFxx** " mark displayed on the LCD display indicates the current **FB** location (CF value) used. Use **FB_RST** to reset the FB to location 0. Do not forget to reset the CF value to 0 if it is not used, or select the FB where the CF is 0. The FBs can be used to store different CF values for different frequency band for fine adjustment of the displayed signal level if the signal frequency is known. **(move cursor by 1st button to "SAVE" in the menu and 2nd button to save the new CF or FB value.)**

(10) Most high frequency RF antenna such as Mobile phone base station is vertical polarized (in vertical direction), therefore the ED65 is normally used in vertical direction. Please rotate the meter to find the maximum reading direction. The LCD reading will also increase as you approach the signal source. This way, ED65 can be used to find the location of signal source.

(11) Most of modern communication devices (Mobile phone, Wireless LAN, Wi-Fi, etc.,) use digital communication technology with burst RF signals. When measuring this type of RF signals, several LED lights may blinking at the same time. This is normal and can be used as an indication of burst type of digital RF signals. For continues waves (AM/FM) signals, the LED light will stable. ED65 measures peak power level of signal with very quick response time. It is more accurate than the needle style of readout or other digital meter which only shown the average value of signal power most of the time. (example: low duty cycle digital RF burst signals)

(12) To turn-on/turn-off the LCD backlight, go into " HOLD " mode first, and then toggle the " MODE " button to turn-on/turn-off the LCD backlights. Remember to turn-off the LCD backlight to reduce the battery current consumption.

(13) ED65 is a broadband High frequency RF signal power level measuring device. It is used for applications such as Mobile phone base station antenna radiation, Microwave oven, Cellular/cordless phone, Radio transmitters, and WiFi wireless LAN installation aid.
It is not for low frequency magnetic field measurement (AC power transformer, high voltage Power transmission line, motor ...etc.,) which should be measured with Gauss-meters such as CORNET ED25G RF/LF dual mode meter.



LED table and Field strength/power density readout:

LED color	Power level	Power density	Indication	Action
RED3	-5 dBm ↑	0.18 w/m^2	Safety range#3 Italy standard (0.1w/m-sq)	Caution!
RED2	-10 dBm	0.058 w/m^2	Safety range#2 Swiss standard (0.04w/m-sq)	Caution!
RED1	-15 dBm	0.018 w/m^2	Safety range#1 Russian standard (0.02w/m-sq)	Caution!
YELLOW3	-20 dBm	0.0058 w/m^2		safe
YELLOW2	-25 dBm	1.8 mw/m^2		safe
YELLOW1	-30 dBm	0.58 mw/m^2		safe
GREEN3	-35 dBm	0.18 mw/m^2	Wireless LAN, WiFi typically in this range	safe
GREEN2	-40 dBm ↓	0.06 mw/m^2	Some signal source around	safe

-- ED65 use 8 high brightness LED to indicate the measured power and power density. With 3 safety range indications.
-- The power level and power density level conversion in the table is calculated based on the ED65 internal antenna. And is For ED65 only.

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NOTE:

*** Electromagnetic wave field strength/power density reduces very fast with distance (distance square), keep a good distance from the high frequency RF signal source can reduce the high frequency radiation effect. Alumina foil or window sun reflector film (silver color) can be used as an effective and cheap shielding material for most of RF radiations.**

*** ED65 is designed for quick living environment RF radiation evaluation and reference only. Official RF safety radiation measurement procedure is complicate and should be handled by trained technical person with lab instruments. Safety range standard are listed here as a reference only. ED65 is not a medical instrument, Please do not use it in medical, legal certification or other related applications. This product is not for commercial rental purpose/use.**

*** The "SENSOR" mark on the bottom of the back enclosure is not used in the CORNET ED65**

*** Please do not touch the factory setup if you get into the "Factory Setup" menu by accident. Unless you have the laboratory RF signal generator, it is highly possible to mess up the factory calibration value and make the meter un-useful. Do not push any button if you get into the Factory Setup menu. Just turn-off the power of the meter to exit the "Factory Setup" mode.**

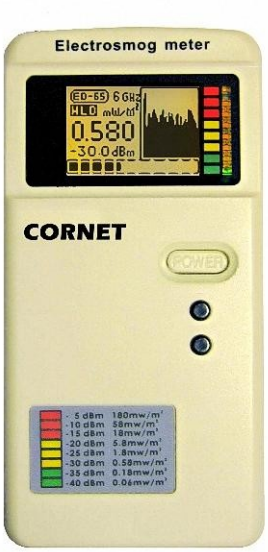
The European Community provided general guidelines in its Council Recommendation of July 1999.[1] ICNIRP published similar guidelines in April 1998.[2] Table I gives a sampling of the international and national field-strength limit values for the general public and continuous exposure

		950Mhz	1850Mhz
International	Council Recommendation 1999/519/EC	42 V/m (4.75W/m^2)	59 V/m (9.25W/m^2)
International	ICNIRP Guidelines, April 1998	42 V/m (4.75W/m^2)	59 V/m (9.25W/m^2)
Austria	ÖNORM S1120	49 V/m (6.33W/m^2)	61 V/m (10W/m^2)
Belgium	Belgisch Staatsblad F.2001-1365	21 V/m (1.18W/m^2)	30 V/m (2.31W/m^2)
Germany	26. Deutsche Verordnung	42 V/m (4.75W/m^2)	59 V/m (9.25W/m^2)
Italy	Decreto n. 381, 1998	6 V/m (0.1W/m^2) 20 V/m (1W/m^2)	6 V/m (0.1W/m^2) 20 V/m (1W/m^2)
The Netherlands	Health Council	51 V/m (6.92W/m^2)	83 V/m (18W/m^2)
Switzerland	Verordnung 1999	4 V/m (0.04W/m^2)	6 V/m (0.1W/m^2)
United States	IEEE C95.1	49 V/m (6.33W/m^2)	68 V/m (12W/m^2)
China	Draft: National Quality Technology Monitoring Bureau	49 V/m (6.33W/m^2)	61 V/m (10W/m^2)
Japan	Radio-Radiation Protection Guidelines, 1990	49 V/m (6.33W/m^2)	61 V/m (10W/m^2)

Sampling of international and national field-strength limits for mobile communications frequencies (reference only).

Specification:

Sensor type:	Electric field sensor with internal sensing antenna
Frequency range:	100MHz to 6GHz
Sensitivity:	-55dBm to 0dBm
Dynamic range:	60 dB
Peak power measurement:	0.0015 mw/m² to 580 mw/m²
Field strength measurement:	0.025 v/m to 14.8 v/m
Display type:	Digital LCD display & LED color segment display
Unit of measurements:	dBm, mw/m² or v/m
Display error rate:	± 3 dBm
LCD back light:	12- 15 seconds auto-off, manual on/off control
Display of data:	LCD 3 to 5 digit, 8 LED color segment, Histogram of 30 reading, LCD Bar segment (5 dBm/segment)
Safety standard indication:	3 safety range indication by 3 Red LED
Battery used:	9V alkaline battery, (not included)
Battery life:	>20 hours
Internal Antenna:	build-in dipole antenna



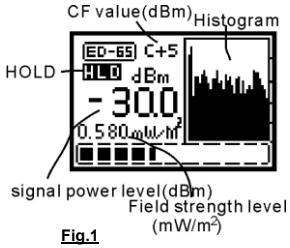


Fig.1

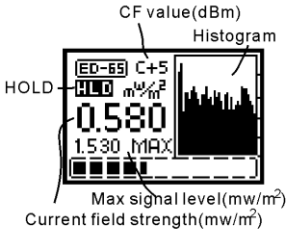


Fig.2

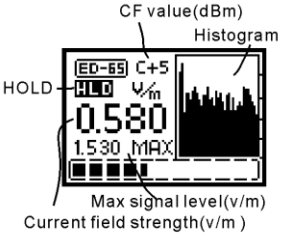


Fig.3

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